NARRATIVE PROPOSAL WORK PLAN
2019 & 2020 TARGETED AIR SHED GRANT PROGRAM
RFA # EPA-OAR-OAQPS-20-01

Project Title: Locomotive Replacement Project in the Western Mojave DesertBasin

Project Description: Replace an uncontrolled and unregulated 1984 four- axle 2400 brake horse power locomotive.

Applicant Name: California Air Resources Board (CARB) on behalf of the Mojave Desert Air Quality Management District (MDAQMD)

Address:
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Submitted on behalf of:
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Funding Requested: **$3,183,465.39**
Voluntary Cost Share: **$488,835.00**
Total Project Cost: **$3,672,300.39**
Project Period: October 20, 2020 to June 30, 2022

Applicant Eligibility: MDAQMD is an air pollution control agency, as defined by Section 302(b) of the CAA, that: (a) has responsibilities for development and implementation of a state implementation plan to attain and maintain national ambient air quality standards for ozone and PM2.5 within Mojave Desert Air Basin and Riverside County's Palo Verde Valley. The proposed project is located in the Western Mojave basin which is an ozone nonattainment area per the (2015 8-hour standard of 70 parts per billion). The MDAQMD does not have an active air program grant under Section 103 or 105 of the CAA; however, the California Air Resources Board will be applying on our behalf.

DUNS number: **1959302760000**

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1) Project Summary and Approach

The Mojave Desert Air Quality Management District (MDAQMD) is submitting the "Locomotive Replacement Project in the Western Mojave Desert Air Basin" for the replacement of an uncontrolled/unregulated 1984 Electro-Motive Division of General Motors (EMD) diesel-electric four-axle road switcher locomotive with a Tier 4 Knoxville Locomotive Works Series 4000 diesel-electric four-axle road switcher locomotive in response to the EPA "2019 Targeted Air Shed Grant Program" (EPA-OAR-OAQPS-20-01) Request for Applications (RFA) pertaining to the Mojave Desert Air Basin. The Tier 4 Series 4000 is the cleanest available technology and the replacement project will maximize the emission reductions.

The MDAQMD stretches out over almost 20,000 square miles of California's vast desert expanse. As the air pollution control agency for San Bernardino County's High Desert and Riverside County's Palo Verde Valley, the MDAQMD has primary responsibility for controlling emissions from stationary sources of air pollution. The District is committed to protecting the air for more than 500,000 residents living within its boundaries while supporting strong and sustainable economic growth. Currently, the Western Mojave Air Basin is ozone severe non-attainment area based on the 2015-2017 Air Quality Measurements. One of the goals of the Targeted Airshed grant is to implement projects that can demonstrate documentable reductions in precursor emissions of ozone which include nitrogen oxides (NOx), and volatile organic compounds (VOCs), and/or direct or precursor emissions of $PM_{2.5}$. The MDAQMD has identified the ozone precursor nitrogen oxide (NO_x) as the most significant air quality challenge in meeting the upcoming ozone standard deadlines in our jurisdiction: specifically coming from mobile sources through the combustion of fuels. This replacement project will have a direct impact on the West Mojave Desert Air Basin by reducing NO_x in an area that is classified as an 8-hour ozone severe nonattainment.

Mobile sources in municipal and business transportation make up the large portion of NOx emissions in the Mojave Desert Air Basin and have been identified as the most significant sources with adverse impact on air quality and public health, particularly in Disadvantaged Communities (DA) communities. The day to day operations and activities in these communities results in high levels of emissions of ozone precursors, toxic air contaminants including diesel PM and greenhouse gases. In order to mitigate these emissions, MDAQMD strongly supports many pathways to accelerated deployment of near zero-emission technologies and locomotive(s) replacement project(s) due to their long equipment life is one way to accomplish these goals.

In the proposed project, MDAQMD will contract with Mojave Northern Railroad Company (MNRC) and CEMEX (parent company) to replace one (1) uncontrolled/unregulated 1984 EMD diesel-electric four-axle road switcher locomotive with a Tier 4 Knoxville Locomotive Works Series 4000 near zero emission diesel-electric four-axle road switcher locomotive. The existing locomotive is owned by Mojave Northern Railroad Company ("MNRC"). MNRC is an affiliate company to CEMEX, a multi-national cement producer. MNRC's revenue is generated from train operations carrying clinker from mining operations to CEMEX's cement facility in Victorville, California. MNRC operates several heavy-haul six-axle locomotives which drive trains consisting of twenty empty gondola cars thirteen miles up a maximum gradient of 3.85 percent. The trains return downhill with twenty loaded cars filled with clinker (sintering limestone and alumino-silicate materials). The trains operate four round trips daily Monday through Friday and three round trips on Saturday and Sunday all day, all year. The uncontrolled/unregulated unit operates at least half of the time in a low-income community and within a ½ mile of a disadvantage community.

The current locomotive proposed for the MNRC Project (UDL 418) is a switching and road-switching locomotive utilized for storing, sorting and positioning empty rail cars at the quarry loadout

and Riverplant clinker stations and for the assembly of loaded gondola cars for the train. It operates 24/7 and 355 out of 365 days per year in area that is classified as an 8-hour ozone severe nonattainment; the remaining 10 days are reserved for maintenance. Periodically, during six-axle locomotive outages, it will be utilized for the train routes. In switching services at the two stations, it consumes on average 42,600 gallons of fuel annually. Annual average fuel consumption increases when it is removed from switching services to train services. Without a grant award the UDL 418 locomotive will continue to operate for the next nineteen (19) years (possibly longer after an overhaul) in a severe ozone nonattainment area. The UDL 418 locomotive is considered one of, if not the highest single mobile source emitters of nitrogen oxides ("NO_X") and particulate matter ("PM") for a switcher locomotive in the MDAQMD. All short-line locomotives in Mojave's jurisdiction contribute 190 tpy in NO_X. This particular unit contributes 17 tpy (8.9%) of that total. The following table sets out the equipment and operational details of the locomotive engine that will be replaced and information on the replacement unit.

Item	Project-Specific Detail 1984	Project-Specific Detail Series 4000
Original Equipment Builder	Electro-Motive Division of General Motors	Knoxville Locomotive Works, Inc.
Original Equipment Build Date	1984	2020
Original Equipment Model	GP39-2	NZE23B DE T4L
UMLER Identification	MN 418	TBD
Locomotive Unit / Frame Serial Number	837058-17	TBD
Locomotive Brake Horsepower	2,400	2,300
Engine Model Number	12-645-E3C	KLW-MTU 12V4000 R54 T4L
Engine Serial Number	84-02-1005	TBD
Engine Build Date	1984	2020
Operating Hours Annually	8400-8600	7,700-7,800
Operating Service(s)	Switching & Short Haul	Switcher and Road-Switcher Services
Fuel Usage	42,000-45,000 gallons annually	34,080
Type Fuel	California compliant dyed diesel #3PG3	Dyed diesel #3 PG3
Idle Limiting Equipped	No automatic engine start stop	Yes
Idling Hours Annually	4,200-4,300	3,500

*Additional information on the Tier 4 Knoxville Locomotive Works 4000 near zero emission Series diesel-electric four-axle road switcher locomotive in Exhibit B.

The replacement unit uses a 12-cylinder KLW-MTU EPA Tier 4 certified engine rated at 2,300 brake horsepower ("bhp"). The KLW Series 4000 road switcher locomotive is equipped with a TMV TECU integrated global positioning system ("GPS") to assist in compliance with reporting and usage

requirements. The integrated software also tracks and monitors remotely the locomotive and engine performance, including annual reporting capabilities for hours operated, MW hours operated, gallons of diesel fuel consumed and operational hours and percentages by throttle positions (idle through notch 8).The KLW NZE Series freight rolling stock equipment are the first and only single engine switcher, short haul and line haul locomotive models in horsepower classes from 1,050 bhp to 3,218 bhp to obtain Tier 4 EPA locomotive certification to near zero emissions standards for locomotive duty cycle services utilized in freight haulage movement.

MNRC will be reimbursed the cost to acquire the Tier 4 near zero-emission Series 4000 road-switcher (see Table 1). The new unit will be located at the CEMEX-Victorville California Plant located at 16888 E Street. The plant is located in a low-income community as defined by Assembly Bill 1550. Please see Figure 1, page 6.

MDAQMD requests $2,694,670.79 from the 2019 Targeted Air Shed Grant Program to fund the near-zero emission road switcher locomotive which includes administrative costs to implement and support the project.

Table 1

Project Cost	Funding Requested
$3,672,300.39	$3,183,465.39

The MDAQMD staff has experience in undertaking this type of project, both in technical expertise and project management. Experience with the Carl Moyer Memorial Air Quality Standards Attainment Program has provided MDAQMD the understanding and tools needed to successfully implement the Air Shed Grant Program.

Implementation of the proposed project is estimated to neither increase/decrease the number of road switcher locomotives in Mojave's jurisdiction but will replace an uncontrolled/unregulated unit with a near zero-emission Tier 4 Engine. The 1984 EMD four-axle road switcher locomotive will be destroyed pursuant to the 2017 Carl Moyer Program Guidelines to ensure permanent and enforceable emission reductions. In addition, MDAQMD will follow the documentation and verification standards as it pertains to the Carl Moyer Memorial Air Quality Standards Attainment Program. Additionally, the proposed project supports EPA's Strategic Plan to *deliver real results to provide Americans with clean air, land, and water.* In addition, this also meets the State of California 2016 Mobile Source Strategy of *Advancing Low-Emission and Zero Emission Technologies for Off-Road Equipment.*

<u>Explanation of Project Benefits to the Public</u>

The Air Shed Grant will allow the district to replace an uncontrolled/unregulated 1984 road switcher locomotive located in a low-income community within the Western Mojave Air Basin. The proposed project is estimated to reduce annually .389 tons per year (tpy) of $PM_{2.5}$, 16.877 tpy of NO_x and 2.155 tpy of ROGs emissions for the replacement of the 1984 EMD road switcher locomotive with a Series 4000 near zero emission road switcher unit. In other words, there will be a 99% reduction in NO_x and PM as compared to the 1984 unregulated/uncontrolled unit. The reductions will achieve immediate and on-going improvements in air quality and public health, particularly in communities where the residents are disproportionately impacted by the adverse effects of high levels of emissions. The project will also improve

the quality of life for the community. Replacing the old locomotive with the new one will significantly reduce noise pollution in the communities through which it passes, due to the fact the new locomotive is quieter compared to the old one.

The longer-term goal of this project is to promote market acceptance of near-zero emission road switcher locomotive, professional jobs related to the maintenance of the unit. Anticipated project outputs and outcomes are summarized in Table 2.

Table 2: Anticipated Outputs and Outcomes

Activities	Outputs	Short and long term outcomes(1)
• Replace of one (1) 1984 EMD diesel-electric four axle road-switcher locomotive	• Operation of near zero-emission diesel-electric four-axle road switcher locomotive. • Reduce fuel usage and idling hours as compared to the 1984 EMD unit	Short-term (per year): • Reduce .389 tons of PM2.5, 16.877 tons of NOx, and 2.155 tons of ROGs emissions, annually. • 99% reduction in NOx and $PM_{2.5}$ Long-term: 15 yrs. • Lifetime reductions of 5.835 tons of $PM_{2.5}$, 253.155 tons of NOx, and 32.325 tons of ROGs emissions. • Decrease public health risk to residents in populated areas • Accelerate market acceptance and deployment of near-zero emission locomotives.

(1) The 2017 Carl Moyer Program Guidelines were used to calculate the emission reductions for the project.
(2) Emission factors obtained from the 2017 Carl Moyer Program Guidelines were used in the emission reduction calculations.
(3) Cost-effectiveness calculations and emission reductions based on maximum project life for a locomotive replacement project of 15 years as stated in 2017 Carl Moyer Program Guidelines.

Explanation of Emission Source Category

Emissions reductions addressed by this proposed project are summarized below in Table 3.

Table 3. Emissions Source Category and Criteria Pollutants Addressed by the Proposed Program

Proposed Program	Potential Audience Served	Source	Pollutants
Replacement of uncontrolled/unregulated 1984 road switcher locomotive.	CEMEX and immediate surrounding low-income community.	Locomotive	ROGs, NO_x, $PM_{2.5}$

Maximization of Total Project Benefits and Cost-Effectiveness

The District has calculated that the project will reduce NOX by 16.877 tons per year ("tpy"), reactive organic gases ("ROG") by 2.155 tpy, and particulate matter ("PM") by 0.389 tpy. Over the fifteen-year (15) lifetime of the project, total emission reductions will be 253.155 tons of NOX, 32.325 tons of ROG, and 5.835 tons of PM. MDAQMD used the latest version of the mobile source emission model designated by EPA for use in modeling mobile source emissions for state implementation plan purposes. The calculations

suggest that switcher and short haul locomotive replacement and repowering projects are cost- effective on a dollars-per-ton-emitted basis and on this basis MDAQMD has also concluded that this project is highly cost effective. Reference Exhibit A.

2) Community Benefits, Engagements and Partnerships

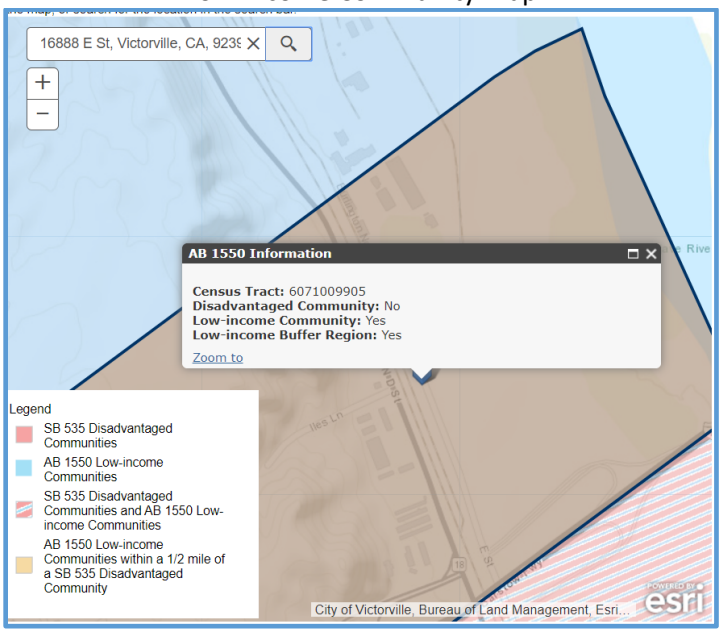
Mobile sources in municipal and business transportation make up the large portion of NOx emissions and have been identified as the most significant sources with adverse impact on air quality and public health, particularly in disadvantaged and low-income communities. The day to day operations and activities in these communities results in high levels of emissions of ozone precursors, toxic air contaminants and greenhouse gases. In order to mitigate these emissions, MDAQMD strongly supports many pathways to accelerated deployment of near zero-emission technologies and locomotives are one of ways to accomplish this. For example, by replacing the road switcher locomotive over the fifteen (15) year project life the Air District expects to see a reduction of 253.155 tons of NOx emission and a 5.835 tons of diesel PM. The reduction in PM is significant as CARB has identified diesel PM as a toxic air containment and is labeled as a carcinogen. The reduced NOx emissions will have a positive impact on air quality and public health in the community.

The proposed Locomotive Replacement Project in the Western Mojave Desert Basin will primarily affect the City of Victorville located in the Victor Valley of southwestern San Bernardino County, California. Per US Census data the City of Victorville has a population of 122,312 people with a median household income of $50,691.00. More than half of the city is considered to be a disadvantaged or low-income community as defined by Senate Bill 535 (De Leon, Chapter 830, Statutes of 2012) and Assembly Bill 1550 (Gomez, Chapter 369, Statutes of 2016).

The replacement project will have its largest impact on the surrounding areas of the CEMEX-Victorville plant located at 16888 E Street which has been identified as a low-income community (see Figure "1"). Low-income communities and households are census tracts and households, respectively, that are either at or below 80 percent of the statewide median income, or at or below the threshold designated as low-income by the California Department of Housing and Community Development's (HCD)

Figure 1

Low-income Community Map



The proposed project is estimated to reduce annually .389 tpy of $PM_{2.5}$, 16.877 tpy of NO_x and 2.155 tpy of ROGs emissions for the replacement of the old locomotive with a Series 4000 Unit: a reduction of 99%. Over the fifteen-year project life we expect to see a reduction of 253.155 tons of NOx and a 5.835 tons of diesel PM emissions. The reduction in PM is significant as CARB has identified diesel PM as a toxic air containment and is labeled as being carcinogen. The project will achieve immediate and on-going reductions in emissions and thus will improve the air quality and public health in a vulnerable community.

Lastly, the project will also address a need expressed by the community and stakeholders. The Air District has held public meetings and the community expressed an interest in increasing use of near-zero emission technology (all-electric when possible). The MDAQMD as part of the administrative fees will continue to hold public meetings inviting stakeholders, community-based organizations and concern citizens to participate in our goal of promoting clean air and contributing to a reduction in emissions. In order to increase participation in these meeting the MDAQMD will be utilizing the following engagement strategies: (1) direct mailers to citizens living in areas that are most impacted by emissions, (2) radio ads with information on when meetings will be held and (3) social media updates and blasts on how to promote clean air. It is the District's aim to use these meetings as a platform for future partnership and to work as an entity for building and supporting partnerships for everyone involved. Lastly, through our communication and educational outreach team the Air District will also work with local school districts to arrange educational field trip to tour the new road switcher locomotive. The point of these trips will be to increase awareness of new near zero emission locomotive technology and how grants can help increase air quality in the communities.

3) Project Sustainability

The long-term goal of this project is to: (1) promote market acceptance of near zero emission locomotives and (2) create professional jobs related to the maintenance of the unit. Successful implementation of the near zero emission locomotive will help encourage other railroad/locomotive organizations in the transportation sector to adopt this technology. For example, the BNSF Locomotive Railyard in Barstow also resides within the non-attainment area. The railyard provides a large number of jobs for the surrounding community. If the new Tier 4 Series 4000 four axle proves successful at the CEMEX plant then those results can be duplicated at the BNSF Barstow Railyard. If BNSF adopts the technology the surrounding area will see an immediate reduction in emission from a road switcher locomotive unit. In addition, the new locomotive units in turn will create a demand for trained professional jobs as it relates to the maintenance of the new technology. The project will also contribute in achieving ozone standards for the Western Mojave Air Basin. Currently, the Western Mojave Air Basin is classified as an 8-hour ozone severe nonattainment. 2017 emission inventory data indicates that short-line locomotives in Mojave's jurisdiction contribute 190 typ in NO_X yearly; as a whole all locomotives/trains account for 28% of all the NOx within the jurisdiction yearly. This particular unit contributes 17 tpy (8.9%) of that total. By destroying the old unit and replacing it with the cleanest available Tier 4 technology the Air Basin can achieve a 8.9% reduction in total locomotive/train emissions as a whole.

Lastly, the MDAQMD in conjunction with the Mojave Environmental Educational Consortium (MEEC) whom is an organization that improves the environmental literacy of students, teachers and the communities of the Mojave Desert Region by actively providing educational resources will work with MNRC/CEMEX and MEEC to promote the new technology and offer resources to explore and learn more about the technology from an educational standpoint. To ensure we are meeting these goals this information will be included in the quarterly reports submitted to CARB on the project status.

4) Environmental Results-Outcomes, Outputs and Performance Measures:

The proposed project will replace one (1) 1984 uncontrolled/unregulated EMD diesel electric four-axle road switcher locomotive with a Tier 4 Knoxville Locomotive Works 4000 Series diesel-electric four-axle road switcher locomotive. The new locomotive will be Tier 4 Certified unit which exceed the latest emissions standards for the respective pollutants. As the new unit is the cleanest available technology the reductions in NO_x and ROGs will be maximized. In addition, since NO_x and ROGs are ozone precursors, reductions in their emissions will reduce ambient ozone concentrations and will help the Western Mojave Air Basin achieve ozone standard. The replaced unit will be destroyed in accordance with Carl Moyer Guidelines by a licensed dismantler to ensure permanent and enforceable reductions. A certificate of destruction will be provided to the District by the dismantler and will remain in the project file. Total emission reductions of for this project of $PM_{2.5}$ and NO_x are shown in Table 4.

Table 4*. Expected Outcomes and Outputs

Program Title	Annual Emission Reductions (TPY)			Lifetime Reductions (Tons)		
	$PM_{2.5}$	NO_x	ROGs	$PM_{2.5}$	NO_x	ROGs
Locomotive Replacement Project	.389	16.877	2.155	5.835	253.15	32.325

*Emission reductions are calculated using the Carl Moyer Cost-Effectiveness Calculations as it pertains to locomotives.

In order to ensure the emission reductions and fuel savings the operator will provide quarterly reports to the MDAQMD for the duration of the grant which concludes on June 31, 2020. The reports will document fuel usage and idling hours of the Series 4000 road switcher. In addition, the reports will also document any downtime of the unit as well as any maintenance issues encountered. The reports will be required in order to ensure the unit is operated and the emission reductions are realized. The MDAQMD will work with CEMEX to ensure all emission reductions are realized which may include extending the project life if necessary. Within 90 days of the end of the grant agreement CARB will submit a final report. The final report will include all of the information required for quarterly reports but summarized for the duration of the project. In addition, the final report will include the narrative summary of the project, project outcomes, emission benefits calculations, and impact on air quality, including ozone and PM2.5 trends and design values. As an additional reporting mechanism and to ensure the emission reductions are realized for the project life. The MDAQMD will require MNRC to submit annual reports to the Air District. The annual reports will include all information required to be submitted as part of the quarterly report.

The longer-term goal of this project is to promote market acceptance of near zero emission road switcher locomotives, professional jobs related to the maintenance of the unit. On a quarterly basis, MDAQMD will report to CARB the project status, including milestones such as the delivery of the locomotive and any challenges and delays encountered, updated timeline, if necessary, funds expended, and other pertinent information. Once the reports are submitted to CARB, CARB will then submit the reports to EPA on the Air District's behalf. A final report will be submitted by CARB to EPA within 90 days of the end of the grant agreement.

5) Programmatic Capability and Past Performance:

Roles and Responsibilities of MDAQMD and Project Partners:

The MDAQMD staff will implement the proposed incentive program, monitor progress and submit quarterly reports to EPA on progress and findings of this project. Quarterly reports will contain accomplishments, description of any slippages and challenges, and other pertinent information. The MDAQMD will also submit to EPA a final performance report, within 30 days following the expiration of the grant project period. The report shall be submitted to the EPA Project Officer and may be submitted electronically. The report shall generally contain the same information as in the quarterly reports, but will cover the entire project period. Upon approval by the MDAQMD Board, MNRC/CEMEX will receive a contract/agreement to replace the 1984 EMD road switcher locomotive and the old unit will be destroyed by a licensed dismantler to ensure permanent and enforceable emissions reductions.

Description of Applicant's Organization and Experience:

Description of MDAQMD

The MDAQMD stretches out over almost 20,000 square miles of California's vast desert expanse. As the air pollution control agency for San Bernardino County's High/Low Desert portions and Riverside County's Palo Verde Valley. For the last 25 years the MDAQMD has been the air pollution control agency responsible for monitoring and regulating air pollution within Mojave's jurisdiction. The District is committed to protecting the air for more than 500,000 residents living within its boundaries while supporting strong and sustainable economic growth. The close proximity to mountains and natural resources makes the Western Mojave an ideal location for cement manufacturing plants. Unfortunately, many of the short-haul locomotives used in the transportation process are uncontrolled engines. Despite best efforts to upgrade and replace the equipment; the 2018 Targeted Air Shed Grant has identified/classified the Western Mojave basin as severe-ozone nonattainment area per the (2015 8-hour standard of 70 parts per billion).

CARB/ MDAQMD Experience

With respect to grant management, CARB has accepted several U.S. EPA grants in the past three years, including: Section 105 Air Pollution Control Financial Assistance Grant (Grant Number A-00901315), PM 2.5 Monitoring Network Grant (Grant Number PM-00T41301), and the State Clean Diesel Grant (Grant Number DS-99T62501). Each of these recent grants represents a continuation of a multi-year, multi-million dollar grant from U.S. EPA. For each grant, CARB has completed all grant agreement terms and completed (or expects to complete) the approved work plans to expeditiously apply funds to shared U.S. EPA and CARB air quality goals. CARB has documented progress on these grants through submittal of required reports and inputting collected data into state and national databases, as appropriate per the grant terms.

Additionally, CARB has extensive experience implementing multi-million-dollar incentives programs, such as the Lower-Emission School Bus Program, the Carl Moyer Memorial Air Quality Standards Attainment (Moyer) Program, Goods Movement Emission Reduction (Goods Movement) Program, the Air Quality Improvement Program (AQIP), and the Providing Loan Assistance for California Equipment (PLACE) Program. CARB's experience in these programs has established solid working relationships with Air Districts as well as engine/equipment and retrofit manufacturers and vendors necessary for successfully implementing the proposed project.

During FY 2017-18, the MDAQMD supported and administered a variety of projects and technologies stemming from our Carl Moyer Memorial Grant Funding, Voluntary NOx Remediation and Community Action Program funding. In Fiscal Year 2018-19 the District awarded 3.6 million in cost-effective replacement projects across the basin. Projects that have been or will be completed will replace older polluting, heavy-

duty off-road equipment with newer, cleaner technology that meet the current emissions standards. In addition, MDAQMD has a long history of successfully collaborating with stakeholders to reduce emissions from stationary and mobile sources.

This project consists of purchasing, replacing and destroying a locomotive pursuant to the 2017 Carl Moyer Memorial Air Quality Standards Attainment Program. The MDAQMD completed a similar locomotive replacement project. Following consultation with U.S. EPA and in cooperation with CARB, MDAQMD was able to cost share the price of upgrading a pre-1973 uncontrolled unit to a new Tier 4 unit (Table 5). The MDAQMD Locomotive project combines funds from the (1) Detroit Diesel Corporation (DDC) environmental mitigation funds. (2) The Carl Moyer Program and the (3) Operator. By bringing all three stakeholders together the MDAQMD was able to fund a project that would have otherwise been cost prohibitive to the operator. Hence, the MDAQMD is familiar with the agreements/contracts, timelines, tasks and resources needed to complete such a project.

Table 5

Program Title	Carl Moyer Grant	Detroit Diesel Consent Decree	Operator Cost-Share
MDAQMD Locomotive Project (Tier 0 to Tier 4 Locomotive Replacement Project)	$1,000,000	$1,604,250	$852,909

Lastly, MDAQMD has successfully been implementing air quality incentive programs, such as the Carl Moyer Memorial Air Quality Standards Attainment Program for over a decade. MDAQMD is capable of successfully planning, implementing, and administering an EPA sponsored diesel emissions reduction program.

Staff Expertise, Qualification, Knowledge, and Resources

For 25 years, MDAQMD has thoroughly demonstrated its capabilities and expertise to successfully plan, implement, and administer similar types of projects. The highly technical MDAQMD staff has the resources necessary to meet the goals of the proposed project. As stated previously, MDAQMD will administer project funds and provide comprehensive project management including managing grants, preparing and managing a contract for the proposed program, and monitoring the progress of the program. The proposed project will be implemented by MDAQMD staff. Primary staff assigned includes:

Ms. Sylvia Vanderspek is Chief of the Air Quality Planning Branch at the California Air Resources Board, a position she has held since 2013. In this capacity, Ms. Vanderspek is responsible for the all Clean Air Act state implementation planning for ozone and particulate matter pollution, emission inventory development and State Strategy development. Ms. Vanderspek has almost 25 years of experience in the air pollution field with almost 20 years working on state implementation planning required to meet federal air quality standards. Recently, Ms. Vanderspek oversaw the development of over 15 SIPs for PM2.5, PM10 and ozone that are guiding CARB's rulemaking for a number of years. As part of the rulemaking development, Ms. Vanderspek managed development of the Mobile Source Strategy, last updated in May of 2016. The Mobile Source Strategy is groundbreaking in that it integrates the planning efforts of California's multiple air quality and climate goals. The 2016 State SIP Strategy, the air quality element of the Mobile Source Strategy, has also been developed under her guidance and was adopted by CARB in 2017. Ms. Vanderspek is overseeing the development of the revised Mobile Source Strategy this year. In addition, Ms. Vanderspek oversees implementation of a woodstove change-out program funded by an U.S. EPA Targeted Airshed Grant

Kasia Turkiewicz, an Air Resources Engineer with the California Air Resources Board, Kasia has over 20 years of experience evaluating air quality, meteorological, and emissions data to better understand the nature and causes of elevated PM concentrations. For the past four years she has managed CARB's Woodsmoke Reduction Program funded with $8M from the Greenhouse Gas Reduction Fund. This program offers financial incentives for California residents to replace old, inefficient, and highly polluting wood stoves, inserts, and fireplaces with cleaner burning and more efficient home heating devices. Kasia was also lead staff in developing the State Implementation Plan for the woodsmoke-dominated PM2.5 nonattainment area in Plumas County, California where she oversees the implementation of a woodstove change-out program funded by an U.S. EPA Targeted Airshed Grant.

Mrs. Jean Bracy is the Deputy Director of Administration for the MDAQMD. Mrs. Bracy has managed the MDAQMD Grants program for more than 20 years, and managed grants from other federal agencies including EPA, FTA and FHWA. At the MDAQMD with support of one employee, she administers grant programs with funds from federal sources, and incentive grant programs with funds from state and local sources. During her tenure at the MDAQMD she developed the Mobile Source Emissions Reduction Program conducting a competitive grant program to distribute more than $15 million dollars collected from local vehicle registration fees. She led the effort to redesign the program in 2017 to enhance the distribution of funds to achieve MDAQMD goals to improve reductions from mobile emissions. She organized the work to redesign the MDAQMD Carl Moyer Memorial Air Quality Standards Attainment Program for updated state guidelines, and distributed more than $11 million dollars over 10 years for off road projects designed to improve reductions from mobile emissions. With the support of one full time employee (Jorge Camacho) she administers these incentive grant programs in addition to MDAQMD Clean Air Fund, with local agency funds

Mr. Jorge Camacho is the Grants Specialist for the MDAQMD. Under direction of the Deputy Director, he plans, analyzes, organizes, and coordinates all aspects of the grant program that support the mobile source emissions reduction and related grant programs and special projects. Which includes hands-on-work with grantees, calculating cost-effectiveness, evaluating project outcomes, ranking projects for priority with regards to funding tracking and follow up for on time reporting and milestone achievements across a wide variety of emission reducing projects (from locomotives to cranes). He is the primary source for regulatory and program guidelines to measure program compliance. In addition, he has over 5 years of experience managing and implementing projects while working for the County of San Bernardino.

Estimated Project Timeline:
Description of Specific Actions: The tasks for the proposed programs are as follows:

Task 1	**Grant Agreement**
Task 1.1	Execute a grant agreement with CARB/EPA
Task 1.2	Solicit final application requirements from MNRC/CEMEX
Task 2	**Contracts Execution**
Task 2.1	MDAQMD to receive approval by its Governing Board.
Task 2.2	MDAQMD to develop and execute contracts with MNRC/CEMEX
Task 3	**Manufacture of KLW Series 4000 Locomotive**
Task 3.1	Finalize Purchase requirements and locomotive specifications KLW
Task 3.2	Issue purchase and place/order new locomotive

Task 3.3 KLW manufacturers' new locomotive
Task 4 Delivery
Task 4.1 MNRC/CEMEX take delivery and accepts locomotive
Task 4.2 Perform necessary training
Task 4.3 MNRC/CEMEX destroys old locomotive
Task 5 Reporting Requirements
Task 5.1 Report project status on a quarterly basis to CARB/EPA
Task 5.2 Determine air quality benefits achieved through the proposed project*
Task 5.3 Submit final report to CARB/EPA

**Based on Emission Reduction Calculations as laid out in the Carl Moyer 2017 Guidelines.*

Estimated Timeline Overview for Each Task: A detailed project plan is divided into four major tasks as outlined below in Table 6.

Table 6: Estimated Timeline for Project Milestones ****Tentative also the locomotive will take between 8-9 months to manufacture.*

Milestone	2020				2021				2022	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Task 1: Grant Agreement										
1.1 Execution of Agreement with EPA										
1.2 Solicit final application requirements from MNRC/CEMEX										
Task 2: Contracts Execution										
2.1 Board Approval										
2.2 Contract Execution										
Task 3: Manufacture of KLW Series 4000 Locomotive										
3.1 Finalize purchase agreement with KLW										
3.2 Execute purchase and place order										
3.3 KLW manufactures locomotive										
Task 4: Delivery										
4.1 MNRC/CEMEX takes Delivery										
4.2 Perform necessary training										
4.3 MNRC/CEMEX destroys old locomotive										

Task 5: Monitoring and Reporting										
5.1 Quarterly Reports										
5.2 Air Quality Benefit Analysis										
5.3 Final Report										

6) Budget

Budget and Estimated Funding by Task

The expected cost of the budget is not to exceed $3,672,300.39 to replace the 1984 unregulated/uncontrolled EMD road switcher locomotive with a new Tier 4 Series 4000. The amount also includes administrative cost. The amount requested from the TAG Grant is $3,183,465.39.

Procedures for Efficient Expenditures

The MDAQMD staff has extensive experience managing both incentive and demonstration projects. Our highly technical staff has the resources and expertise necessary to successfully implement the proposed project, including drafting a contract with appropriate terms and conditions, detailed task descriptions, and payment schedules tied to milestones to ensure all required tasks have been satisfied before any funds are paid out. In addition, MDAQMD will closely monitor the progress of the project via telephone calls, e-mails, meetings and site visits as well as quarterly progress reports provided by the contractors. Invoices are generally processed and paid out within 30 days of the receipt by the MDAQMD to ensure projects are not negatively affected by delayed reimbursements.

Table 7: Itemization of Costs

Line Item and Itemized Cost	EPA Funding	**Cost-Share
Personnel - Air Resources Engineer @ $59.87/per hour *460 hours	**27,538.96**	
Fringe Benefits @ 34.98%	**9,633.13**	
Other- Cost Pass-through to the District	**3,129,487.80**	
Other- (Operator and Private Contribution cost share)		**488,835.00**
Total Direct Charges	**3,166,659.89**	**488,835.00**
Indirect Cost (ICRP 45.21%) (Personnel + Fringe)*45.21%	**16,805.50**	
Total Federal Funding	**3,183,465.39**	
Total Project Cost (federal and non-federal)	**3,672,300.39**	

Table 8: Other - Cost Pass-through to the District

Line Item and Itemized Cost	%	EPA Funding
District Personnel		
(1) Grants Specialist @ $47.10/hr @650 hours		
Percentage of time per task:		
Task 1 Grant Agreement: 30% of total hours	30.00%	
Task 2 Contract Execution: 10 % of total hours	10.00%	$30,615.00
Task 3 Manufacture of Locomotive: 10 % of total hours	10.00%	
Task 4 Delivery: 10% of total hours	10.00%	
Task 5 Reporting Requirements: 40% of total hours	40.00%	
(2) Deputy Director-Administration @ $131.77/hr @ 350 hours		
Percentage of time per task:		
Task 1 Grant Agreement: 30% of total hours	30.00%	
Task 2 Contract Execution: 10 % of total hours	10.00%	$46,119.50
Task 3 Manufacture of Locomotive: 10 % of total hours	10.00%	
Task 4 Delivery: 10% of total hours	10.00%	
Task 5 Reporting Requirements: 40% of total hours	40.00%	
(3) Executive Director/APCO @ $156.94/hr @ 85 hours		
Percentage of time per task:		
Task 1 Grant Agreement: 40% of total hours	40.00%	
Task 2 Contract Execution: 40% of total hours	40.00%	$13,339.90
Task 3 Manufacture of Locomotive: 0% of total hours	0.00%	
Task 4 Delivery: 0% of total hours	0.00%	
Task 5 Reporting Requirements: 20% of total hours	20.00%	
(4) Community Relations Supervisor @ $65.02/hr @255 hours		
Percentage of time per task:	0.00%	
Task 1 Grant Agreement: 0% of total hours	0.00%	
Task 2 Contract Execution: 0% of total hours	0.00%	$16,580.10
Task 3 Manufacture of Locomotive: 0% of total hours	0.00%	
Task 4 Delivery: 50% of total hours	50.00%	
Task 5 Reporting Requirements: 50% of total hours	50.00%	
(5) Air Quality Specialist @ $60.65/hr @150 hours		
Percentage of time per task:		
Task 1 Grant Agreement: % of total hours	0.00%	$9,097.50
Task 2 Contract Execution: 0% of total hours	0.00%	
Task 3 Manufacture of Locomotive: 0% of total hours	0.00%	
Task 4 Delivery: 80% of total hours	80.00%	

Task 5 Reporting Requirements: 20% of total hours	20.00%	
TOTAL DISTRICT PERSONNEL		$115,752.00
FRINGE BENEFITS (40% of Salaries)		40% ($115,752.00)
Retirement, Health Benefits, FICA, SUI		$46,300.80
TOTAL DISTRICT FRINGE BENEFITS		$46,300.80
Equipment		
Purchase of TIER 4 Locomotive		$2,967,435.00
TOTAL DISTRICT EQUIPMENT		$2,967,435.00
TOTAL PASS-THROUGH TO THE DISTRICT		$3,129,487.80

7) Leveraging (Voluntary Cost Share)

Due to the limited funding the MDAQMD receives, the Air District cannot leverage any additional public funds for the Locomotive Replacement Project. However, CEMEX/MNRC (operator cost share) will be contributing $386,549.00 for this project. In addition, there is will another private contribution from the Golf and Ohio Railways, Inc. in the amount of $102,286.00 for this project. The Gulf & Ohio Railways is a holding company for four different short-line railroads in the Southern United States and maintains its corporate headquarters in Knoxville, Tennessee. As per the TAG requirements a letter was provided by the project partner indicating the voluntary funding (Exhibit D). In total there will be $488,835.00 in leverage funds for this project.

Operator Cost-Share	Private Contribution	Total
$386,549.00	$102,286.00	$488,835.00

References:

Carl Moyer Memorial Air Quality Standards Attainment Program
https://www.arb.ca.gov/msprog/moyer/moyer.htm